

NON-PUBLIC?: N
ACCESSION #: 8812050046
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Limerick Generating Station Unit 1 PAGE 1 OF 4

DOCKET NUMBER: 05000352

TITLE: Reactor Protection System Actuation on Intermediate Range Monitor
Upscale due to a Personal Error
EVENT DATE: 04/09/88 LER #: 88-012-01 REPORT DATE: 11/28/88

OPERATING MODE: POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

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Licensing Section

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On April 9, 1988 at 0415 hours an actuation of the Reactor Protection System, an Engineered Safety Feature occurred. A controlled shutdown was in progress and control rod insertion was stopped at 0400 hours to facilitate a gradual reactor depressurization to minimize offgas releases. Approximately three minutes prior to the scram, power began increasing due to the positive reactivity effect of decreasing moderator temperature. Reactor power, initially 27 on range 2, rose to 108 on range 2 where an intermediate range monitor high neutron flux alarm initiated, and caused the scram at 120 on range 2. Reacting to the alarm, the reactor operator was unable to "uprange" all the intermediate range monitors before the scram occurred six seconds after the alarm. All systems actuated as designed and the scram was reset at 0423 hours. There was no release of radioactive material to the environment as a result of this event. The cause of the event was a cognitive personal error when the utility employed licensed reactor operator did not adequately anticipate and observe the effects of decreasing moderator temperature on core reactivity. To prevent recurrence, the

operator was cautioned to be constantly aware of those conditions which affect core reactivity; a caution was added to the general shutdown procedure and additional training of all licensed control room personnel was completed by July 15, 1988.

END OF ABSTRACT

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Plant Conditions Prior to the Event:

Operating Mode 2

Reactor Power 27 on range 2, less than 1%

Unit 1 was being shut down to facilitate work for a minor testing and maintenance outage. The shutdown was being accomplished by individual rod insertions to facilitate a gradual depressurization to reduce off-gas releases. This precaution was taken due to minor fuel cladding defects. A manually initiated 1/2 scram was in place due to the intermediate range monitors (IRMs) being out of surveillance.

Description of the Event:

At 0415 hours on April 9, 1988 an actuation of the Reactor Protective System (RPS), an Engineered Safety Feature (ESF), occurred. The scram actuation was initiated by high flux, 120 on range 2 of the intermediate range monitors (IRMs).

At 0400 hours, the reactor operator had stopped inserting control rods in an effort to control the cooldown rate. At this time reactor power was decreasing steadily. Approximately 6 minutes prior to the scram the reactor operator had "downranged" the IRMs from range 3 to range 2. Within several minutes of "downranging" the IRMs began trending upward as the positive reactivity effect of decreasing moderator temperature was greater than the negative reactivity effects of the control rod configuration, resulting in a net positive reactivity addition. Reactor power, initially 27 on range 2, increased to the high alarm point of 108 on range 2 over several minutes. The reactor operator reacting to the alarm "upranged" the 'A' IRM, but did not "uprange" the 'C' IRM in time to prevent the scram, which occurred six seconds after the alarm. All safety systems actuated as designed. The scram was reset at 0423 hours according to GP-11, General Procedure for Reactor Protection System-Scram Reset.

Consequences of the Event:

At the time of the event a controlled plant shutdown was being conducted. At

the time of the scram, 81 control rods were full in, 88 were full out, and 16 were at notch 04. All rods received #1 a scram signal and were verified to be full in after the scram.

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There was no release of radioactive material to the environment as a result of this event.

Had the event Occurred at a higher power, the transient would have been more pronounced, but within the design basis.

Cause of the Event:

The cause of the event was a cognitive personal error when the utility employed licensed reactor operator did not adequately anticipate the effects of falling moderator temperature on core reactivity and did not properly monitor the IRMs after downranging, several minutes prior to the scram. Control rod insertion had progressed past "the point of adding heat" and moderator temperature was decreasing due to control rod drive (CRD) cooling flow into the reactor, ambient reactor pressure vessel heat losses and depressurization due to main steam users. When the positive reactivity, due to falling moderator temperature, exceeded the negative reactivity of the existing control rod configuration, neutron flux began to increase, until the scram occurred at 120 on range 2. At the time of the event, the operator was making necessary entries in the reactor operator log book. However, he did not properly anticipate the magnitude of the decrease in moderator temperature under the existing conditions. Consequently, he did not properly monitor the IRMs after downranging six minutes prior to the scram.

Corrective Actions:

All control rods were verified to be full in and the scram was reset at #-0423 hours.

Actions Taken to Prevent Recurrence:

The operator involved was cautioned to be constantly aware of conditions which affect core reactivity and act accordingly. GP-3, General Procedure for Normal Plant Shutdown has been revised to caution the operator about the effects of decreasing moderator temperature on core reactivity.

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The continuing training program for licensed personnel will review a controlled shutdown and reemphasize the need to constantly monitor process indications when

in a transient condition. This training was complete by July 15, 1988.

The plant has initiated "Interim Setpoint Change Requests" to change the alarm setpoint of the IRMs from 108/125ths of scale to 80/125ths of scale to allow additional time for operator response to an "upscale" alarm.

EIIS Codes:

Reactor Protection System, JD

Intermediate Range Monitor, IG

Control Rod Drive System, AA

Offgas System, WF

Previous Similar Occurrences:

None

Tracking Codes: A8 Personnel Error,
Failure to Observe Changing Conditions

ATTACHMENT 1 TO 8812050046 PAGE 1 OF 1

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E. P. FOGARTY November 28, 1988
MANAGER
NUCLEAR SUPPORT DIVISION Docket No. 50-352

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER details a Reactor Protection System actuation, an Engineered Safety Feature, caused by a personal error.

Reference: Docket No. 50-352
Report Number: 88-012
Revision Number: 01
Event Date: April 09, 1988
Report Date: November 28, 1988
Facility: Limerick Generating Station
P.O. Box A, Sanatoga, PA 19464

This revised LER is being submitted to correct several errors in the original LER including an incorrect statement regarding the control rod pattern at the time of the event. Where appropriate, updated information is provided. The original LER was submitted pursuant to the requirements of 10CFR 50.73(a)(2)(iv).

Very truly yours,

E. P. Fogarty
Manager
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